# Mapping of Literature on "Encephalitis'': A Scientometrics Study (1967-2017)

A

SYNOPSIS

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## 1.Introduction:

Mapping is a study of correlation links between the past and the present research work using citation analysis. Useful graphical technique helps to understand connections and establish relative relation between things, individuals, materials, lectures, textbooks, data gatherings, surveys, conversations, disagreements, gap analysis, education and synthesis. The mapping process starts with identification through research and critical analysis of literature issues, in particular, of research and growth, authorship pattern, distributed of cited journals, research trends, etc.., on a particular subject. In the present study, a scientometric approach has been used to map the encephalitis literature. (Joseph 2010)

scientometric analysis is one of the techniques of mapping that emphasizes that journals, most profusely cited, can be taken to be the most desirable ones in a library collection, for they are likely to be frequently used by the scientists.

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**Booksein (1995)** Defined scientometric as "the science of measuring science" scientometric is also considered as bibliometric measurement for evaluation of scientific development, social relevance and impact of application of science and technology.

## *Encephalitis:

Infections, and less commonly other causes, in the brain and spinal cord can cause dangerous inflammation. This inflammation can produce a wide range of symptoms, including fever, headache, seizures, and change in behavior or confusion and, in extreme cases, can cause brain damage, stroke, or even death.

Infection of the meninges, the membranes that surround the brain and spinal cord, is called meningitis. Inflammation of the brain itself is called encephalitis. Myelitis refers to inflammation of the spinal cord. When both the brain and the spinal cord are involved, the condition is called encephalomyelitis.

## 1. Review of Literature:

A Literature search on LISA plus and other subject bibliographies revealed that various studies have been reported some LISTA, Google search to know the trends of scientific communication in individual journals. In this chapter for important attempts shall be made to review some journals in the subject area of scientometric.

- **International:**

**Egorov, V. M. (1970).** The results are reported of a scientometric of activities of the radiobiology section of the institute of south sea biology of the Ukrainian academy of science. The exponential patterns of the growth of research staff, publications, and citation rate of the section's principal investigator have been established. This citation rate is shown to be applicable as an efficiency criterion of the performance of the entire section

**Bowers, R. (1980).** Information on basic research in the physical sciences is not readily available in science indicators--1976, but it can be synthesized from many chapters of the report. The indicators show that there has been a greater decline in real support by the federal government for the physical sciences than for engineering, the social sciences, or the life sciences. Additional information is needed on the response to this reduction in funding. The author concludes by calling for an accounting of the costs and benefits to basic research of reduced funding and suggests items which should be included in such an accounting

**Gilbert,G.N(1978)** In this study the growth of science are critically reviewed to access by their strengths and weaknesses. The study focus on the problems involved in measuring two aspects of scientific growth, 1. Growth in man power and 2. Knowledge. A result shown that the design of better indicates depends on careful consideration of the theoretical framework within which the indicators are intended to be used. Recently in the sociology of social science suggest ways in which the validity of existing indicators may be assessed and improved.

**Guay, Y(1988)** It explains a count of the publications of a sample of the major pharmaceutical multinational companies. These institutions have been divided into three geographical group: Europe, the United states and japan. Result shown that research activates in this industry have been subjected to some changes between 1965 and 1979. Among these changes is the growing importance of fundamental research, the erosion of the leadership of U.S based in situation and the growing importance of overseas research.

**Narin, F & Whitlow, E.S(1991)** This Paper presents how CHI Research. Inc. developed bibliometric indicators for the US National Science Board's science Indicators reports and extended them to the study of publication, co-authorship and citation within 29 scientific fields related to various European community programs. It found that internationally coauthored papers to be cited two times as highly as papers authored by scientists working at a single institution in a single country. It also focused on the degree of international co-authorship did not appear to be particularly dependent on size and that there was increased co-authorship.

**Schubert, A (2000)** He focused on Scientometric topics of particular interest to researchers or research administrators in the medical or medicine related fields. These journals published earlier bibliographies contained almost exclusively Science Citation Index or Social Science citation Index covered items, a considerable part of this bibliography is from other sources, those referred in the MEDLINE database. Includes a title index, an author index and a keyword index.

**Tonta, Y, & Ilhan, M.(2002)**This study shown that Turkish researchers contribution on science is increasing. They have published more than 6000 articles in 1999 in science journals indexed by the ISI Science Citation Index, placing Turkey in 25$^{th}$ place in world rankings in terms of total contribution to science. The Turkish scientists publish their number of bibliographical publications increasing faster than that of engineering and other non-medical science. Specifically, researchers affiliated with Hacettepe University produce nearly 25% of all the biomedical publications of Turkey that appear in international biomedical literature. This reports on bibliometric characteristics on of total of 1434 articles published from 1988-1997 by scientists in MEDLINE, a well-known bibliographical database.

**Claveria, L. E., Gullar,E ., Cami, J.,& conde, J (2000)**

The basic component of the scientific process is peer review, but its performance has seldom been evaluated systematically. The performance of projects predicts by pre-approved characteristics of research projects. It reports the results of a retrospective study of all 2744 single center research projects financed by the Spanish Health Research Fund1988 & completed before 1996. It finds that performance of funded projects predictors of significant by peer review scores of grant applications and production also higher for projects with a basic research component, longer duration, higher budget or a financed research fellow. It concludes that

funding agencies should monitor selection process and evaluate the performance of funded projects in order to design future strategies in supporting health sciences research.

**Sooryamoorthy, R. (2010) Sooryamoorthy, R (2010).** This study reports that south Africa has made significant strides in the field of scientific production. Medical publications extracting and analyzing for three decades and at regular intervals (1975-2005) from the SCI database. This paper find out whether reported that growth in the production of scientific papers in medicine is an effect of partnership that scholars have with their counterparts within the organization, within the country or in other countries. It also represent the unique patterns of scientific research in medicine, taking consideration factors such as the count and fractional count of papers, trends of growth, citations, sectoral participation, publication outlets, partners and seeks to provide new insights into the directions medical science is talking in south Africa today**.**

**Chinchilla-Rodriguez, Z., Zacca-Gonzalez, G., Vargas-Quesada, B., & Mova-Anegon, F. (2015)** This study focus on characterizes the volume and visibility of Latin American Scientific output in the area of Public Health, through the analysis of bibliometric, scientometric and health indicators of the top 10 Latin American producers of documents. The data was collected by SCImago Institution rankings (SIR) portal, based on Scopus data, for the period 2003-2011. Scientometric analyses a set of quantitative excellence and international collaboration. The socioeconomic indicators measured investment inn health and research and number of researchers. The main result reveal that the research system with the greatest capacity of communicate scientific results are those of Brazill and Mexico and Colombia and Argentina. It show that Uruguay, Puerto Rico and Peru countries with high rates of collaboration. There is a need to find methods that would allow us to evaluate the transfer of research knowledge into practice in scientometric perspective.

**Fukuzawa, N., & Ida,T.(2016)** This study analyze the distributions of paper-paper and paper-patent citations and estimate the relationship between them based on a 4763 paper sample among the top 100 researchers in the life and medical science fields in Japan. They find that paper-paper citations peak at years average, paper- patent citations is 6 years. The U- shaped relationship exists between research grant and research quality, whereas a U-shaped relationship exists between research quality and total number of papers.

**Leydesdorff, L. Comins, J, Sorensen, A, Bronmann, L,& Hellsten, I.(2016**)

They provide mathods and routines that make MeSH terms answerable to broader usage in the study of science indicators: using web of science data. One can be generated analogously. They explore the applicability of the routines in the case of research program about the amyloid cascade hypothesis in Alzheimer's disease. The conclusion is that referenced journals provide archival structures, where as MeSh terms indicate mainly variation at the research front. Furthermore, citing/ cited matrix for main path analysis as a by-product of the software.

## *National:

**Satyanarayana, K and Ratnakar,K.V(1989)** This study reports that the multiple authorship in research papers in biomedical sciences from the basic aspects to clinically oriented research 17 journal were chosen for analysis- 9 from the general and life science categories and 8 from medical sciences groups with clinical orientation. All of thesehigh impact journals, such as the 'science citation index: and were among top ten journals in their respective disciplines. The average authors was significantly higher (P>0.001) in medical journals 4.299 (range 3.21-5.35) as compared to general biomedical journals 3.298 (range – 3.21-5.35). data from highly cited papers (1961-78) also indicate that papers in clinical sciences have higher average authors (2.71) as compared to preclinical basic research (2.25:P>0.26) and more areas such as biochemistry and molecular biology (2.208;P<0.02) in addition, the general and biomedical sciences articles were relatively longer (average 7.75 pages range 2.69-10.07) as compared to medical papers with clinical orientation (average 4.24 pages; range1.80-12.92;P<0.001)

**Kundra,R(1996)** This study evident from the bibliometric study of the publications in the Indian medical Gazette, from 1900to 1945. The decade beginning 1925 is important in the history of medical science in modern India. This is evident from the bibliometric study of the publications in the Indian Medical Gazette, from 1900 to 1945. It explains the evolution of collaboration in field of medical sciences during this period. This study concludes the 1.Pattern of collaboration in basic and applied research in medical science. 2. Trends in the multiplicity of authors: and 3. Type of collaboration. This paper suggests that medical science was still in the developing stage in India in 1900-1945 and there was possibility of its expansion in the near future.

## 3. Data sources:

### 3.1 MEDLINE:

**MEDLINE** (Medical Literature Analysis and Retrieval System Online, or MEDLARS Online) is a bibliographic database of life sciences and biomedical information. It includes bibliographic information for articles from academic journals covering medicine, nursing, pharmacy, dentistry, veterinary medicine, and health care. MEDLINE also covers much of the literature in biology and biochemistry, as well as fields such as molecular evolution.

Compiled by the United States National Library of Medicine (NLM), MEDLINE is freely available on the Internet and searchable via PubMed and NLM's National Center for Biotechnology Information's Etrez system.

### 3.2 MEDLARS Online:

A MEDLAR (Medical Literature Analysis and Retrieval System) is a computerized biomedical bibliographic retrieval system. It was launched by the National Library of Medicine in 1964 and was the first large scale, computer based, retrospective search service available to the general public.

In late 1971, an online version called MEDLINE ("MEDLARS Online") became available as a way to do online searching of MEDLARS from remote medical libraries. This early system covered 239 journals and boasted that it could support as many as 25 simultaneous online users (remotely logged-in from distant medical libraries) at one time.[5] However, this system remained primarily in the hands of libraries, with researchers able to submit pre-programmed search tasks to librarians and obtain results on printouts, but rarely able to interact with the NLM computer output in real-time. This situation continued through the beginning of the 1990s and the rise of the World Wide Web.

In 1996, soon after most home computers began automatically bundling efficient web browsers, a free public version of MEDLINE was instigated. This system, called PubMed, was

offered to the general online user in June, 1997, when MEDLINE searches via the Web were demonstrated, in a public ceremony, by Vice President Al Gore.[5]

## 4. Database:

The database contains more than 26 million records from 5,639 selected publications covering biomedicine and health from 1950 to the present. Originally the database covered articles starting from 1965, but this has been enhanced, and records as far back as 1950/51 are now available within the main index. The database is freely accessible on the Internet via the PubMed interface and new citations are added Tuesday through Saturday. For citations added during 1995-2003: about 48% are for cited articles published in the U.S., about 88% are published in English, and about 76% have English abstracts written by authors of the articles. The most common topic in the database is Cancer with around 12% of all records between 1950-2016, which have risen from 6% in 1950 to 16% in 2016.

## 4.1 About PubMed:

**PubMed** is a free search engine accessing primarily the MEDLINE database of references and abstracts on life sciences and biomedical topics. The United States National Library of Medicine (NLM) at the National Institutes of Health maintains the database as part of the Entrez system of information retrieval.

From 1971 to 1997, MEDLINE online access to the MEDLARS Online computerized database primarily had been through institutional facilities, such as university libraries. PubMed, first released in January 1996, ushered in the era of private, free, home- and office-based MEDLINE searching.[1] The PubMed system was offered free to the public in June 1997, when MEDLINE searches via the Web were demonstrated, in a ceremony, by US Vice President Al Gore.

PubMed Central should not be confused with PubMed. These are two very different services at their core. While PubMed is a searchable database of biomedical citations and abstracts, the full-text article referenced in the PubMed record will physically reside elsewhere. (Sometimes in print, sometimes online, sometimes free, sometimes behind a toll-wall accessible

only to paying subscribers). PubMed Central is a free digital archive of articles, accessible to anyone from anywhere via a basic web browser. The full text of all PubMed Central articles is free to read, with varying provisions for reuse.

**5. Need for the study**: The exponential growth of medical scientific literature, inter-disciplinary nature of research and trend towards specialization has posed many problems for both scientists and librarians. Further the development of national and international information systems caused the need for an analysis of literature used by scientists. The extensive investigations and abundance of literature being published contributed to immense escalation of cost for the libraries towards the acquisition of literature published. Further, due to the lack of adequate funds, the libraries are not in a position to acquire all the periodicals, at least in broad fields.

In this direction bibliometrisc analysis has now become a well-established part of information research. So far no comprehensive study on the pattern of the use of literature by the researchers in the subject area of medical science will have been made. Hence, with a view study the research trends and to provide some basic information about the characteristics of literature used by the researchers in encephalitis, the present study, namely, exploring the research trends and Scientific Productivity in the subject area of encephalitis: a scientometric analysis has been undertaken

## 6. STATEMENT OF THE PROBLEM:

The statement of the research problem is **"Mapping of Literature on "Encephalitis'': A Scientometric Study (1967-2017)"**

## 7. SCOP OF THE STUDY:

This study focuses on the assessment of important aspects of publication patterns and research trends in the subject area of encephalitis scientometric technique. This study is restricted to analysis of citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher websites. Publications from other sources are not included in this study

## 8. LIMITATIONS OF THE STUDY

1. This study is restricted only to the subject area of encephalitis

2. The study is further restricted to only to the research output published in the database of PubMed

3. To study period covers from 1967 to 2017

## 9. OBJECTIVES:

The study has been designed with the following objectives:

1. To quantify the scientific productivity on encephalitis, Test the growth of literature weather it follows Linear/ Exponential/Logistic pattern in the subject area of encephalitis
2. To study the collaborative dimensions like Collaborative Index, Degree of Collaboration and Collaborative Co-efficient in the subject area of encephalitis
3. To observe the nature of Authorship pattern in the literature of encephalitis
4. To examine the applicability of Bradford's Law of scattering to the pattern of Journals used by the researchers and Lotka's inverse square Law in subject area of encephalitis
5. To trace the core journals of encephalitis and to investigate the cross National analysis of the scientific productivity in the subject area of encephalitis.
6. To find the impact factor and obsolescence of literature in the subject area of encephalitis.

## 10. HYPOTHESES:

In order to fulfill the above mentioned objectives, the following hypotheses were formulated.

1. The growth of research publications in the subject area of encephalitis is exponential pattern
2. The scientific productivity of encephalitis domain follows logistic/ linear growth pattern.

3. The observed Authorship data distribution is same as the theoretical Authorship data distribution in the subject area of encephalitis.

4. Encephalitis literature conforms that of the Bradford's law of scattering

5. The degree of collaboration in the subject area of encephalitis is higher leading to multiple authorship.

## 11. Methodology:

The scientometric method has used for a study of subject area of encephalitis by the help of PubMed database.

### 11.1 Universe and Sample

Collection of journals in encephalitis covered in PubMed databases on encephalitis for the period 1967-2017 shall be considered as source of data for the present study.

The data shall be compiled from online journal articles from the PubMed database. For each Cited reference, the following data will be noted: a) number of author(s), b) Type of document, c) country of origin of the document/journal. d) affiliation of article e) form of publication f) journal self - citation, g) author self- citation, h) impact factor of each journal and other data required for analysis,. Details of publications shall be entered in the SPSS. Finally the data will be arranged as per the objectives of the study. The data so collected shall be analyzed and tested with the help of various statistical techniques and Bibliometrics laws so also prove and disprove the formulated hypothesis of the study.

### 11.2 Statistical Tools and Techniques:

Statistical tool for analysis the data by using SPSS package. Following statistics shall be used to study the nature and growth and publication pattern of literature;

1. Relative Growth Rate of articles

   a) Linear growth: $F_o(t)=\text{Log } a+b^t$

   b) Exponential growth: $F(t)=ae^{bt}$

   c) Logistic growth: $U_t=\frac{k}{1+\mu}$

2. Doubling Time

3. Collaboration Measures:

a) Degree of collaboration

b) Collaborative coefficients

c) Collaborative index

$$g = \frac{N_m}{N_m + Ns}$$

g= Group coefficient of a discipline

Nm=Number of multiple authors during a specific period in a discipline.

Ns= Number of single authored works in a discipline during a given period of time.

4. Lotka's law of scientific productivity: $x^n y$= constant

5. Bradford law of scattering of articles: $n_1:n_2:n_3 = 1:\alpha:\alpha^2$ where α is constant

6. Half-life period

7. Obsolescence studies

8. Regression analysis

9. K-S test

10. Chi-square test

## 12. ORGANIZATION OF THE STUDY

The entire research outcome shall be presented in the following chapters.

**Chapter-I: Introduction**

In this chapter introducing the topic, relevance, statement of the Problem, objectives, scope, limitations, hypotheses, and definition of key terms shall be covered.

**Chapter -II: Research Design and Methodology**

The methodology followed for the present study will be explained in detail in this chapter.

**Chapter-III: Review of Related Literature**

This chapter deals with the review of related literature for the study. This includes report of the past studies conducted in this area and other related areas.

**Chapter -IV**: **Scientometric studies**

In this chapter basically covers about the basic laws of bibliometric and gives the over view of scientometric studies

**Chapter IV: Analysis of Scientific Productivity output on Encephalitis**

The data shall be analyzed to determine the quantification of research output, publications pattern and the results are presented in this chapter.

**Chapter V: Testing of hypotheses and inferences**

All the hypotheses will be tested and the inferences shall be presented in this chapter.

**Chapter VI: Summary of findings and conclusions**

Gives the entire summary and findings and conclusion of the study

## Conclusion:

Scientometrics is a field**,** which applies quantitative method to the study of science as an information process. It is a scientific discipline activity and reveals its objective quantitative regularities. using this method to study the medical science area of subject Ensephalities.

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